

Claims

[c1] **What is claimed:**

1. A martial arts exercise device comprising:
a target means configured to receive strikes from said user;
a target hit detector means of detecting when said target means has been struck by said user;
a visual signaling means for signaling to said user;
a voice command recognition means of recognizing voice commands from said user, and;
a control means, operatively interfaced to said target hit detector means and to said visual signaling means and to said voice command recognition means.

[c2] 2. The device of claim 1, including a striker means for striking at said user, operatively interfaced to said control means.

[c3] 3. The device of claim 1 wherein said control means includes an electronic processor.

[c4] 4. The device of claim 1 wherein said visual signaling means includes a configurable pixelized display.

- [c5] 5. The device of claim 4 wherein there is a plurality of said configurable pixelized display, wherein each member of said plurality of said configurable pixelized display may be placed in any of multiple locations with respect to said user, providing multiple simultaneous visual signaling locations to said user.
- [c6] 6. The device of claim 1, including an audio signaling means for signaling to said user, operatively interfaced to said control means.
- [c7] 7. The device of claim 1, including a step detection means to detect the position of the feet of said user, operatively interfaced to said control means.
- [c8] 8. The device of claim 7 wherein said step detection means comprises a surface with a first array of pressure-sensitive sensors that are positioned together in an inner area and also a second array of sensors in an outer area surrounding said first array of sensors such that a step distance of greater length is required for increased difficulty for said user.
- [c9] 9. The device of claim 1, including a tilt means for determining when said target means has been struck too hard.
- [c10] 10. The device of claim 2, including a means for chang-

ing the speed of said striker, operatively interfaced to said control means.

- [c11] 11. The device of claim 1, including a target adjustment means for adjusting the height position of said target for accommodating the preferences of said user.
- [c12] 12. The device of claim 2, including a striker adjustment means for adjusting the height position of said striker for accommodating the preferences of said user.
- [c13] 13. The device of claim 1 including hit strength sensing means for discriminating the strength of the strike of said user on said target means, wherein said hit strength sensing means is operatively interfaced to said control means.
- [c14] 14. The device of claim 1 wherein said voice command recognition means is comprised of a microphone operatively interfaced to an analog-to-digital conversion subsystem, wherein said analog-to-digital conversion subsystem is operatively interfaced to said control means, wherein the related software instructions and the matchable target command patterns are stored in said control means.
- [c15] 15. The device of claim 14 wherein there is a plurality of said microphones and a corresponding plurality of said

analog-to-digital conversion subsystems, for improved noise cancellation and improved fidelity of voice command recognition.

- [c16] 16. The device of claim 1 wherein said voice command recognition means is comprised of a wireless transmitter and microphone placed close to the mouth of said user, and a wireless receiver operatively interfaced to an analog-to-digital conversion subsystem, wherein said analog-to-digital conversion subsystem is operatively interfaced to said control means, wherein the related software instructions and the stored matchable target command patterns are stored in said control means.
- [c17] 17. The device of claim 6 wherein said audio signaling means is comprised of a plurality of audio speakers driven by an audio digital-to-analog conversion subsystem, operatively interfaced to said control means, wherein the desired audio patterns are stored in said control means.
- [c18] 18. The device of claim 6 wherein said audio signaling means is comprised of a wireless audio receiver and a headphone speaker placed close to the ear of said user, and a wireless transmitter driven by an digital-to-analog conversion subsystem, operatively interfaced to said control means, wherein the desired audio patterns are

stored in said control means.

- [c19] 19. The device of claim 1, wherein said target means is configured to receive lateral strikes, such as a straight punch, and is also simultaneously configured to receive upward strikes, such as an uppercut.
- [c20] 20. A method of martial arts exercise comprising the steps of:
 - providing a target means configured to receive strikes from said user;
 - providing a target hit detector means of detecting when said target means has been struck by said user;
 - providing a visual signaling means for signaling to said user;
 - providing a voice command recognition means of recognizing voice commands from said user;
 - providing a control means, operatively interfaced to said target hit detector means and to said visual signaling means and to said voice command recognition means; said control means controlling a game, said game being responsive to said target hit detector means, and said game being responsive to said voice command recognition means;
 - said control means controlling said visual signaling means in response to the programmed instructions of said game, including those instructions that are respon-

sive to said target hit detector means and said voice command recognition means.

- [c21] 21. The method of claim 20, further comprising:
using a network operatively interfaced to said control means so that multiple users can simultaneously exercise together and compete against each other.
- [c22] 22. The method of claim 20, further comprising:
said control means controlling a game that is unrelated to the striking of said target means for the purpose of improving mental technique for physical action.